

Compact Titrator

G10S/G20S



METTLER TOLEDO

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1 Introduction

Thank you for choosing a METTLER TOLEDO Compact Titrator. The Compact Titrator is an easy-to-operate instrument for titrations.

About this document

This document provides you with the information you need to get started with your METTLER TOLEDO titrator.



For a comprehensive description of the instrument and its functions, refer to the Operating Instructions, supplied as PDF file on the CD.

The instructions in this document refer to titrators running firmware version 5.2.0 or higher.

If you have any additional questions, contact your authorized METTLER TOLEDO dealer or service representative.

► www.mt.com/contact

Conventions and symbols



Refers to an external document.

Note for useful information about the product.

Elements of instructions

■ Prerequisites

1 Steps

2 ...

⇒ Intermediate results

⇒ Results

2 Safety information

- Read and understand the information in this User Manual before you use the instrument.
- Keep this User Manual for future reference.
- Include this User Manual if you pass on the instrument to other parties.

If the instrument is not used according to the information in the Operating Instructions or if it is modified, the safety of the instrument may be impaired and Mettler-Toledo GmbH assumes no liability.



For a comprehensive description of the instrument and its functions, refer to the Operating Instructions, supplied as PDF file on the CD.

2.1 Definition of signal words and warning symbols

Safety notes are marked with signal words and warning symbols. These show safety issues and warnings. Ignoring the safety notes may lead to personal injury, damage to the instrument, malfunctions and false results.

Signal words

WARNING for a hazardous situation with medium risk, possibly resulting in death or severe injury if not avoided.

NOTICE for a hazardous situation with low risk, resulting in damage to the instrument, other material damage, malfunctions and erroneous results, or loss of data.

Warning symbols



Electrical shock

2.2 Product-specific safety notes

Intended use

This instrument is designed to be used in laboratories by trained staff. The instrument is suitable for the processing of reagents and solvents.

Any other type of use and operation beyond the limits of technical specifications without written consent from Mettler-Toledo GmbH is considered as not intended.

Responsibilities of the instrument owner

The instrument owner is the person that uses the instrument for commercial use or places the instrument at the disposal of the staff. The instrument owner is responsible for product safety and the safety of staff, users and third parties.

METTLER TOLEDO assume that the instrument owner provides the necessary protective gear, appropriate training for the daily work and for dealing with potential hazards in their laboratory.

Safety notes



WARNING

Danger of death or serious injury due to electric shock!

Contact with parts that contain a live current can lead to injury and death.

- 1 Only use a METTLER TOLEDO power cable and AC adapter designed for your instrument.
- 2 Connect the power cable to a grounded power outlet.
- 3 Keep all electrical cables and connections away from liquids.
- 4 Replace damaged power cables and AC adapters immediately.



NOTICE

Danger of damaging the touch screen with pointed or sharp objects!

Pressing on the touch screen with pointed or sharp objects may damage it.

- Operate the touch screen by applying gentle pressure with the pad of your finger.



NOTICE

Danger of damage to the instrument due to incorrect parts!

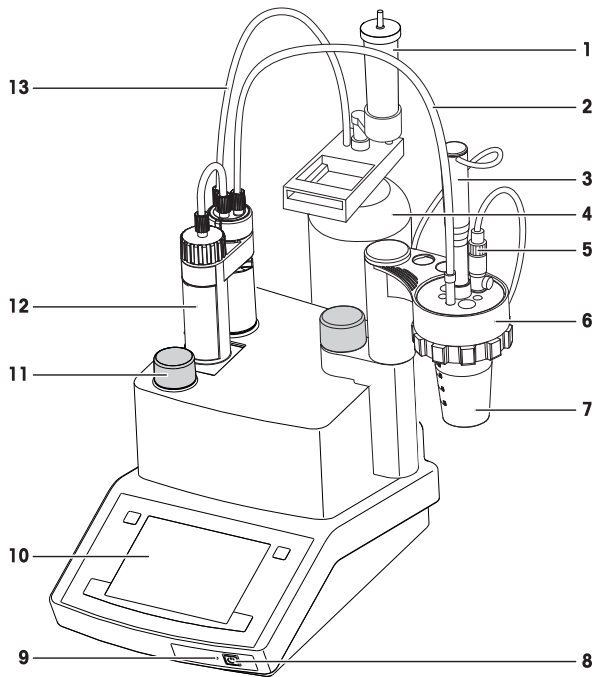
Using incorrect parts with the instrument can damage the Instrument or cause the instrument to malfunction.

- Only use parts supplied with the instrument, listed accessories and spare parts from METTLER TOLEDO.

3 Design and function

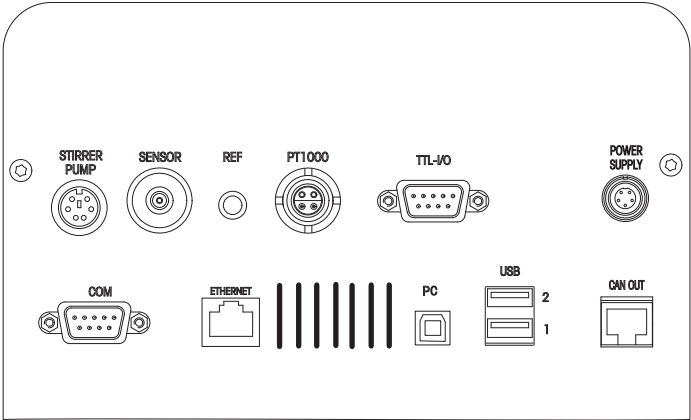
3.1 Instrument

3.1.1 Overview



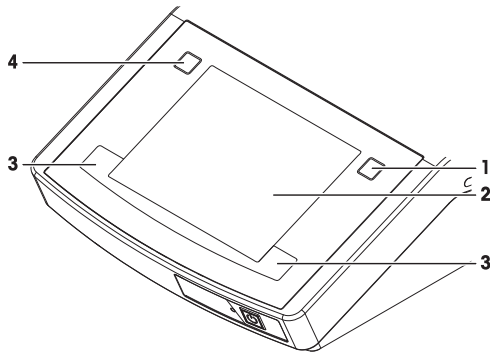
1	Titrant bottle drying tube	8	Power button
2	Dispensing tube	9	Indicator light (LED)
3	Compact stirrer	10	Touchscreen
4	Titrant bottle	11	Burette arrestment knob
5	Electrode	12	Burette
6	Titration stand	13	Suction tube
7	Titration vessel		

3.1.2 Titrator rear panel connections



Connection	Use	Example
STIRRER PUMP	Stirrer/pump	Solvent manager/compact stirrer/pump
SENSOR	Measuring electrode	DGi115-SC
REF	Reference input to SENSOR	
PT1000	PT1000 temperature sensor	DT1000
TTL-I/O	Sample changer	Rondolino
POWER SUPPLY	AC adapter	AC adapter
COM	Balance	MS analysis balance
ETHERNET	Network	Link to LabX PC software via network
PC	PC connection via USB	Link to LabX PC software via USB interface
USB 1/USB 2	Printer/Memory stick/USB hub	USB-P25 compact printer
CAN OUT	CAN connection	For service use

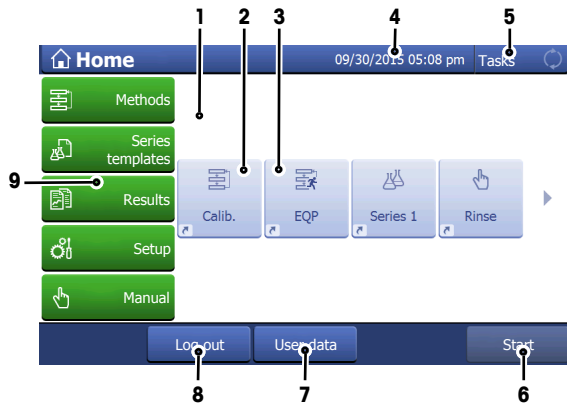
3.1.3 Terminal



Nr.	Name	Function
1	Info button	Accesses the interactive online help for the content of the current dialog.
2	Touch screen	Displays information and can be used to enter information.
3	Home button	Returns you to the home screen from any menu position.
4	Reset button	Ends all tasks that are currently running.

3.2 User interface

3.2.1 Home screen

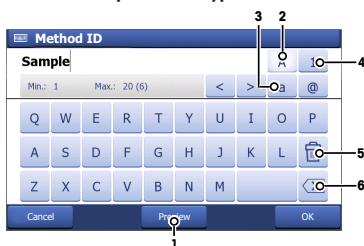


	Name	Explanation
1	Shortcut area	Shows indirect and direct shortcuts for frequently used methods. Shortcuts are saved in the user profile and can be defined, changed and deleted by the user.
2	Indirect shortcut	An indirect shortcut opens the window Start analysis of the method.
3	Direct shortcut	A direct shortcut starts the method without opening the window Start analysis .
4	Status bar	The status bar contains the current menu item, user name as well as date and time.

	Name	Explanation
5	Instrument status	Shows the current working status of the instrument. Blue No measurement running Green Measurement running
6	Start	Switch to direct measurement (quick start for the defined standard measurement of this instrument).
7	User data	Opens a window with information about the currently logged in user.
8	Log out	Directly log out the current user. The window Login opens after logging out.
9	Menus	Methods Create and handle methods for every measurement type. Series templates Open the menu for series templates for every method available on the instrument. Results Display all measurement results, print out or export them. Visit detail information about every single result. Setup Define all system settings in this menu, e.g., hardware settings, user management or user preferences. These settings are usually made during installation of the instrument. Manual Display the manual operations available on the instrument.

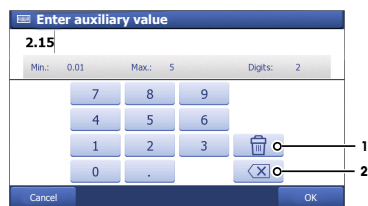
3.2.2 Keypads

Alphabetic keypad



- Tap (1) to see how your input looks like.
- Tap (2) for capital letters.
- Tap (3) for lowercase letters.
- Tap (4) to switch to a numeric keypad and (2) to turn back to alphanumeric.
- Tap (5) to delete all entered letters or numbers.
- Tap (6) to delete the last entered letter or number.

Numeric keypad



- Tap (1) to delete all entered numbers.
- Tap (2) to delete the last entered number.

3.2.3 Menu Structure

Methods

The menu **Methods** has no submenus.

Series templates

The menu **Series templates** has no submenus.

Results

The menu **Results** has the following submenus.

- **All results**
 - Statistics**
- **Samples**
- **Undo all**

Setup

The menu **Setup** has the following submenus.

Menu level 2	Menu level 3
Chemicals	Titriments
	Auxiliary reagents
	Calibration standards
	Titer standards
	Substances
User settings	Language
	Screen
	Audio signal
	Shortcuts
	Keyboard
Values	Blanks
	Auxiliary values
Hardware	Sensors
	Pumps
	Peripherals
	Titration Stands
	Auxiliary Instruments
Global settings	System
	User management
	Analysis and resources behavior
Mainten. & Service	MT-Service
	Import / Export
	Reset to factory settings
	Titration firmware history
	Board firmware
	Terminal
	Board data
	Drives
	Burettes
	Update

Manual

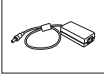
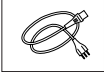
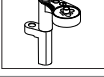
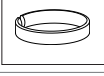
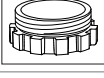
The menu **Manual** has the following submenus.

- **Stirrer**
- **Sensor**
- **Burette**
- **Pump**
- **Auxiliary instrument**

4 Installation

4.1 Standard equipment

4.1.1 Scope of delivery

Part	Order number	G10S	G20S	G20S Rondolino
 Compact Titrator	—	•	•	•
 Sample changer Rondolino TTL	51108500	-	-	•
 Replacement burette (DV1020), complete 20 mL	51107502	•	•	•
 External power supply (100...240 V)	30298362	•	•	•
 Power cable (country-specific)	—	•	•	•
 Protective cover for touchscreen	51105567	•	•	•
 Titration stand without accessories	51109118	•	•	-
 Spacing ring	23842	•	•	-
 Clamping ring	25652	•	•	-
 Threaded ring	25652	•	•	-
 Cap (for titration stand)	51107608	•	•	-

Part		Order number	G10S	G20S	G20S Rondolino
	Clamping screw	51109084	•	•	•
	Electrode holder	51109059	-	-	•
	Reduction for electrode holder	51109052	-	-	•
	pH electrode, DGi115-SC	51109504	•	•	•
	Triaxial SC LEMO cable, 70 cm	89601	•	•	•
	Compact stirrer	51109150	•	•	•
	Titration vessel 100 mL, made from polypropylene (2 pcs.)	–	•	•	•
	NS 14.5 stopper (3 pcs.)	–	•	•	•
	NS 7.5 stopper (3 pcs.)	–	•	•	•
	3 mol/L KCl (25mL)	51343180	•	•	•
	Drying tube with cover	23961	•	•	•
	Drying tube holder	23915	•	•	•
	Glass wool (2 g)	51108143	•	•	•
	CD Titration User Documentation	30297239	•	•	•

Part	Order number	G10S	G20S	G20S Rondolino
 User Manual	—	•	•	•
 Memo Card	—	•	•	•
 Test report	—	•	•	•
 EC declaration of conformity	—	•	•	•

4.1.2 Unpack the titrator

- 1 Remove the titrator (and accessories) from the protective packing material.
- 2 Store the packing material for later transport over long distances.
- 3 Check if you received all parts listed in the scope of delivery.
- 4 Inspect the parts visually for flaws or damage.
- 5 If parts are missing or damaged, report it immediately and file a freight claim if needed.

4.1.3 Position the titrator

The instrument has been developed for indoor operation in a well-ventilated area. The following site requirements apply:

- The ambient conditions are within the limits specified in the technical data.
- No powerful vibrations
- No direct sunlight
- No corrosive gas atmosphere
- No explosive atmosphere
- No powerful electric or magnetic fields

4.1.4 Connect the titrator to the power supply



WARNING

Danger of death or serious injury due to electric shock!

Contact with parts that contain a live current can lead to injury and death.

- 1 Only use a METTLER TOLEDO power cable and AC adapter designed for your instrument.
- 2 Connect the power cable to a grounded power outlet.
- 3 Keep all electrical cables and connections away from liquids.
- 4 Replace damaged power cables and AC adapters immediately.



NOTICE

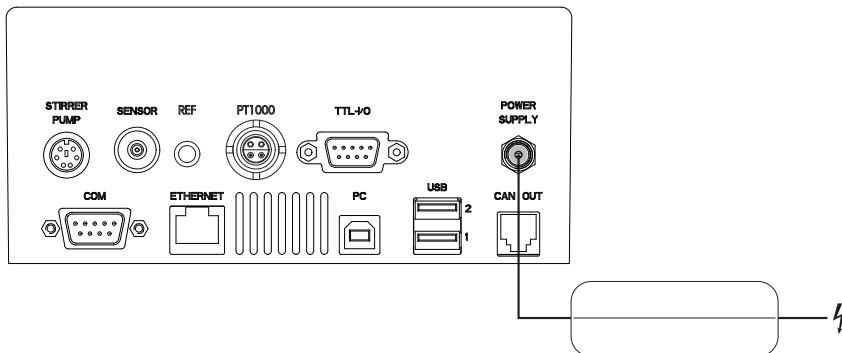
Danger of damage to the AC adapter due to overheating!

If the AC adapter is covered or in a container, it is not sufficiently cooled and overheats.

- 1 Do not cover the AC adapter.
- 2 Do not put the AC adapter in a container.

The titrator is operated using an AC adapter. The AC adapter is suitable for all supply line voltages ranging from 100...240 V AC $\pm 10\%$ and 50-60 Hz.

- 1 Install the cables in such a way that they cannot be damaged or interfere with operation.
- 2 Insert the plug of the power cable in the socket of the AC adapter.



- 3 Insert the plug of the AC adapter in the **POWER SUPPLY** socket at the back of the titrator.
- 4 To secure the connection at the titrator, screw the plug connector firmly into place.
- 5 Insert the plug of the power cable in a grounded power outlet that is easily accessible.

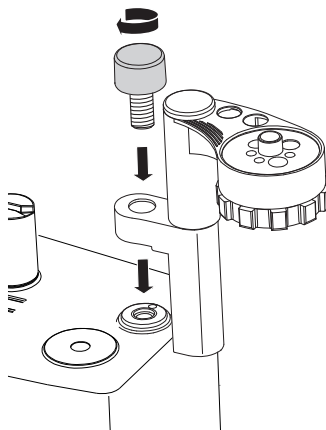
4.1.5 Disconnect the titrator from the power supply

- The titrator has shut down.
- 1 Pull the plug of the power cable out of the power outlet.
 - 2 Pull the plug of the AC adapter out of the **POWER SUPPLY** socket at the back of the titrator.

4.1.6 Install the titration stand

4.1.6.1 Attach the titration stand to the titrator

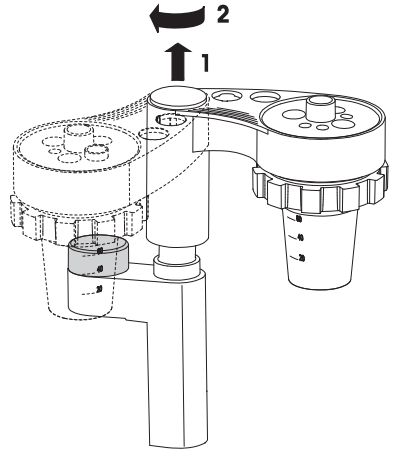
- The spacing ring, clamping ring and threaded ring are mounted on the titration stand.
- 1 Remove the cover from the mounting hole.
 - 2 Position the titration stand over the uncovered mounting hole.
 - 3 Place the screw in the hole of the titration stand and screw it in the mounting hole.
 - 4 Tighten the screw.



4.1.6.2 Swivel the titration stand

The titration stand can be swivelled among three predefined positions. If you use a compact stirrer, use the titration stand in the swivelled out position.

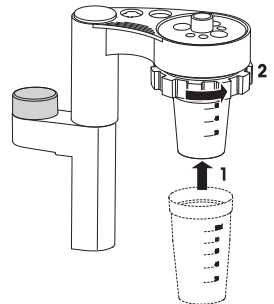
- 1 Pull the titration stand upward out of the holder until you feel resistance.
- 2 Swivel the titration stand to the desired position.
- 3 Slide the titration stand down until it rests on the holder.



4.1.6.3 Attaching and removing the titration vessel

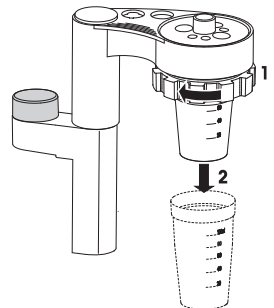
Attaching the titration vessel

- The titration stand is swivelled out.
- 1 Turn the threaded ring a quarter to a half turn clockwise.
 - 2 Guide the titration vessel upward (1) into the titration stand and hold the titration vessel in place.
 - 3 Tighten the threaded ring (2).
 - 4 Check that the titration vessel is firmly attached before you let it go.



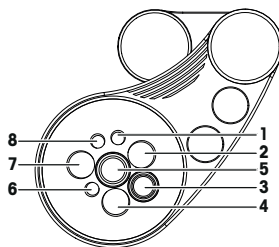
Removing the titration vessel

- The titration stand is swivelled out.
- 1 Hold the titration vessel with one hand.
 - 2 Turn the threaded ring a quarter to a half turn clockwise (1).
 - 3 Pull the titration vessel downward (2) out of the titration stand.



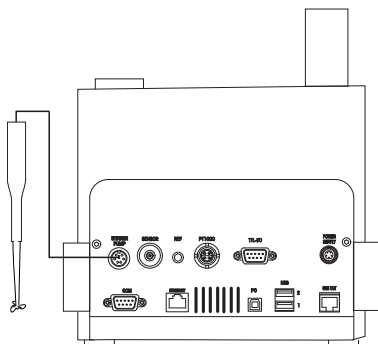
4.1.6.4 Recommended positions for sensors, tubes and stirrers

- 1 Dispensing tube
- 2 Sensor
- 3 Sensor or rinsing unit
- 4 Sensor
- 5 Compact stirrer
- 6 Dispensing tube
- 7 Sensor
- 8 Dispensing tube



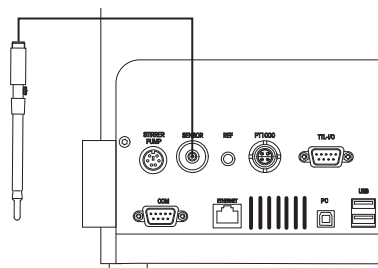
4.1.7 Connect the compact stirrer

- 1 Insert the compact stirrer into the correct opening in the titration stand.
 - 2 Shut down the titrator.
 - 3 Plug the compact stirrer into the **STIRRER PUMP** socket on the rear of the titrator.
 - 4 Start up the titrator.
- ⇒ The titrator detects the connected compact stirrer.



4.1.8 Connect the measuring electrode

- No task is running on the titrator
- 1 Insert the measuring electrode into an opening in the titration stand.
 - 2 Connect the triaxial cable to the **SENSOR** socket on the rear of the titrator.
- ⇒ The titrator detects the measuring electrode.



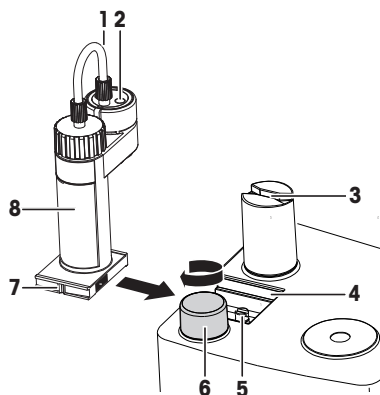
4.1.9 Insert and connect a burette

Current generation burettes are equipped with an Smart Tag on the holder (visible by the small, black cover plate). The Smart Tag is used for reading and writing properties such as titrate name, concentration or usable life.



For a description of the burette, refer to the operating instructions supplied with burettes.

- The burette is assembled.
 - The burette holder is mounted on the titrant bottle.
 - The piston rod (5) is in the home position.
- 1 Turn the arrestment knob (6) in the opposite direction of the arrow.
 - 2 Orient the burette so that the recesses on the driver arm (3) are parallel to the groove (7) on the base of the burette housing.
 - 3 Slide the burette (8) on the guides (4) of the titrator.
 - 4 Turn the arrestment knob (6) in the direction of the arrow to secure the burette.
 - 5 Place the suction tube from the titrant bottle into the left hole (1) of the burette.
 - 6 Place the dispensing tube into the right hole (2) of the burette.
 - 7 To prevent spills, place the free end of the dispensing tube into the titration vessel, the waste bottle or another suitable container.



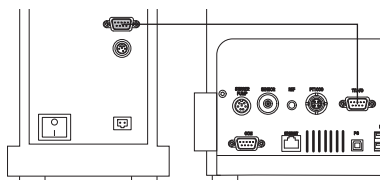
4.1.10 Connect a Rondolino TTL sample changer

The Rondolino sample changer is controlled by TTL signals from the titrator.



The installation of the sample changer is described in the separate Rondolino operating instructions.

- The sample changer is installed and switched off.
- 1 Shut down the titrator.
 - 2 Plug the cable supplied with the sample changer into the **TTL-I/O** socket on the sample changer.
 - 3 Plug the cable into the **TTL-I/O** socket on the rear panel of the titrator.
 - 4 Start up the titrator.
 - 5 Switch on the sample changer.
- ⇒ The titrator automatically detects the sample changer.



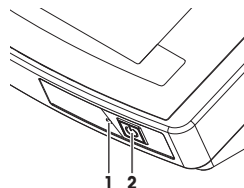
5 Operating the instrument

5.1 Start up the titrator and shut down the titrator

The power button is fitted with an LED and mounted on the front of the titrator. The LED indicates the operating status.

Start up the titrator

- Press the power button (2).
- ⇒ The titrator starts up and detects connected devices.
- ⇒ The LED (1) flashes as the system starts up.
- ⇒ The titrator is ready for use when the LED (1) remains permanently lit.



Shut down the titrator from the touch screen

- Tap **Home > Log out > Shut down**.
 - ⇒ The titrator stops running tasks and shuts down.
 - ⇒ The LED (1) flashes as the system shuts down, which can take up to 60 seconds.
- ⇒ When the LED goes out, the titrator has shut down. The built in AC adapter and the control circuit for the power button are energized. The rest of the titrator is no longer energized.

Shut down the instrument using the power button

- Press the power button for less than 1 second.
 - ⇒ The titrator stops running tasks and shuts down.
 - ⇒ The LED (1) flashes as the system shuts down, which can take up to 60 seconds.
- ⇒ When the LED goes out, the titrator has shut down. The built in AC adapter and the control circuit for the power button are energized. The rest of the titrator is no longer energized.

Shut down of the instrument in emergency situations

- Pull the plug of the power cable out of the power outlet.

5.2 Running a general titration

To explain the procedure for a titration method, a simple acid-base titration with a manual titration stand is described. 5 ml of HCl solution (0.1 mol/L) is titrated with NaOH (0.1 mol/L).

Material

Sensor: DGI115-SC

Chemicals

For this titration you need the chemicals listed below.

- Approx. 5 ml of a HCl solution (0.1 mol/L)
- A titrant bottle containing a carbonate free NaOH solution (0.1 mol/L)
- 3 buffer solutions: pH 4.01, 7.00 and 9.21 from METTLER TOLEDO
- Approximately 50 mg potassium hydrogen phthalate

5.2.1 Preparation

- The titrator is assembled, connected, and installed (see Installation).
 - A compact stirrer is placed in the appropriate opening on the titration stand and connected to the **STIRRER PUMP** output of the titrator.
 - A USB printer is connected to port **USB 1** or **USB 2** of the titrator.
- 1 Tap **Setup > Hardware > Titration Stands > Manual stand > Save**.
 - 2 Prepare the 10 ml burette for the sodium hydroxide.
 - 3 To protect the NaOH solution against CO₂, install a drying tube on the burette holder of the NaOH bottle.
 - 4 Insert the burette.
 - ⇒ An **Info** dialog appears, which allows you to initialize the burette. Burettes only have to be initialized the first time they are used on the titrator.
 - 5 If you use the burette for the first time on the titrator, tap **Initialize**.
 - ⇒ The titrator initializes the burette.
 - 6 When the burette is initialized, remove the burette from the titrator and place the burette back on the titrator.
 - ⇒ The titrator recognizes the initialized burette.
 - 7 To create a new titrant for the burette, tap **Create**.
 - 8 To assign a titrant to the burette, tap **Assign**.
 - ⇒ The system updates the burette data and the assigned titrant appears with the suffix **PnP** in the setup.

- 9 Attach a titration vessel to the titration stand and connect the dispensing tube for the titrant to the titration head.

5.2.2 Rinsing and filling the burette

To fill the burette and tubes with titrant and remove any air bubbles from the system, rinse the burette three times with titrant with the manual operation **Rinse**.

- The titrator is prepared as described in [Preparation ► Page 18].
- 1 To ensure that the system has no leaks, check all tubes and closing points for firm seating.
- 2 Make sure that the free end of the dispensing tube for the titrant is placed in the titration vessel or another container.
- 3 Tap **Manual > Burette > Rinse**.
 - ⇒ The dialog **Rinse** opens.
- 4 Set **Titrant** to **NaOH 0.1 mol/L**.
- 5 Set **Cycles** to "3".
- 6 To start the rinse procedure, tap **Start**.
 - ⇒ The rinse procedure starts and an animation shows the progress.
- 7 When the rinse procedure is complete, tap **OK**.
 - ⇒ The dialog **Rinse** opens.
- ⇒ The burette is filled and the tubes are free of air bubbles.

5.2.3 Calibrating and testing the sensor

The following describes how to calibrate a pH sensor or carry out a sensor test.

Preparation

- 1 Make sure no analysis is running on the titrator.
- 2 Connect the plug of the sensor (DGi115-SC) to the port "SENSOR" of the titrator.
- 3 Insert the sensor into the titration head.
- 4 Prepare three titration vessels containing buffer solutions (pH 4.01, 7.00 and 9.21).

5.2.3.1 Calibrate the sensor

- 1 Tap **Methods > New > Standard method templates > Calibration**.
 - ⇒ A list of method functions appears.
- 2 Tap **Sample (Calib)**.
 - ⇒ The dialog **Sample (Calibration)** opens.
- 3 Make sure **Sensor** is set to DGi115-SC.
- 4 Make sure the settings for the buffer are as listed below.
 - Buffer 1:** 4.01
 - Buffer 2:** 7.00
 - Buffer 3:** 9.21
- 5 Tap **OK > Save**
 - ⇒ The new method is saved in the method list, with the next free ID and with the title **Calibration**.
- 6 Tap **Start**.
 - ⇒ The dialog **Start analysis** opens.
- 7 To ensure that the system has no leaks, check all tubes and closing points for firm seating.
- 8 Tap **Start**.
 - ⇒ The system asks you to attach the titration vessel with sample 1 to the titration arm.

- 9 Attach the titration vessel with the buffer solution with pH 4.01 to the titration arm and tap **OK**.
 - ⇒ The measurement starts after the stirring time.
 - ⇒ During the measurement the online screen displays the time, the measured value in [mV] and a curve.
 - ⇒ During the calibration, the system will output a record on the printer.
 - ⇒ When the measurement is completed, the system asks you to attach the titration vessel with the next sample to the titration arm.
- 10 Remove the titration vessel from the titration arm.
- 11 Rinse the electrode with deionized water.
- 12 Repeat the last 3 steps for the buffer solution with pH 7.00 and the buffer solution with pH 9.21.
 - ⇒ When the calibration is completed, the calibration data is automatically copied to the setup.

5.2.3.2 Test the pH-sensor

- 1 Tap **Methods > New > Standard method templates > Sensor test**.
 - ⇒ A list of method functions appears.
- 2 Tap **Sample (Calib)**.
 - ⇒ The dialog **Sample (Calibration)** opens.
- 3 Make sure **Sensor** is set to DGI115-SC.
- 4 Make sure the settings for the buffer are as listed below.
 - Buffer 1:** 4.01
 - Buffer 2:** 7.00
 - Buffer 3:** 9.21
- 5 Tap **OK > Save**
 - ⇒ The new method is saved in the method list with the next free ID and with the title **Sensor test**.
- 6 Tap **Start**.
 - ⇒ The dialog **Start analysis** opens.
- 7 To ensure that the system has no leaks, check all tubes and closing points for firm seating.
- 8 Tap **Start**.
 - ⇒ The system asks you to attach the titration vessel with sample 1 to the titration arm.
- 9 Attach the titration vessel with the buffer solution with pH 4.01 to the titration arm and tap **OK**.
 - ⇒ The measurement starts after the stirring time.
 - ⇒ During the measurement the online screen displays the time, measurement in [mV] and the curve.
 - ⇒ During the pH-sensor test, the system will output a record on the printer.
 - ⇒ When the measurement is completed, the system asks you to attach the titration vessel with the next sample to the titration arm.
- 10 Remove the titration vessel from the titration arm.
- 11 Rinse the electrode with deionized water.
- 12 Repeat the last 3 steps for the buffer solution with pH 7.00 and the buffer solution with pH 9.21.
 - ⇒ When the pH-sensor test is completed, the data is automatically copied to the setup.

5.2.4 Determining the titer

- 1 Weigh about 50 mg of potassium hydrogen phthalate and dissolve it in a titration vessel containing deionized water.
- 2 Tap **Methods > New > Standard method template > Titer with EQP**.
 - ⇒ A list of method functions appears.
- 3 Tap **Sample (Titer)**.
- 4 Set the parameter **Entry** to **Before** and tap **OK**.
- 5 Tap **Titration (EQP) > Termination**.
- 6 Activate **After number of recognized EQPs**, set **Number of EQPs** to 1 and tap **OK**.

- 7 To exit the method function, tap **OK**.
- 8 To save the new method, tap **Save**.
- 9 To ensure that the system has no leaks, check all tubes and closing points for firm seating.
- 10 Tap **Start**.
 - ⇒ The **Start analysis** dialog opens.
- 11 Enter the sample size.
- 12 Tap **Start**.
 - ⇒ The titer determination begins.
 - ⇒ The titrator asks you to add sample 1/1.
- 13 Attach the titration vessel with potassium hydrogen phthalate solution to the titration head and tap **OK**.
 - ⇒ The titration starts after the stirring time.
 - ⇒ During the titer determination, the online screen displays the measured pH values over the titrated volume in [mL].
 - ⇒ After the titer determination is completed, the titer is copied to the setup.
- 14 After the titer determination is completed, rinse the sensor with deionized water.

5.2.5 Run an EQP titration

5.2.5.1 Prepare the sample

- 1 Fill 5 ml HCl (0.1 mol/L) into a titration vessel and dilute it with approx. 50 mL deionized water.
- 2 Attach the titration vessel to the titration arm.

5.2.5.2 Configure the method

- 1 Tap **Methods > New > Standard method template > EQP**.
- 2 Tap **Title**.
- 3 Enter a title for the new method in the field **Title** and tap **OK**.
- 4 Tap **Sample**.
- 5 In the parameter **ID 1** enter your choice of ID for the sample to be analyzed.
- 6 Set **Entry type** to **Volume**.
- 7 Set **Lower limit** to 6.0 mL.
- 8 Set **Upper limit** to 50.0 mL.
- 9 Set **Entry** to **Before** and tap **OK**.
- 10 Tap **Titration (EQP) > Termination**.
- 11 Activate the parameter **After number of recognized EQPs**, set **Number of EQPs** to 1 and tap **OK**.
- 12 To exit the method function, tap **OK**.
- 13 Tap **Calculation R1**.
- 14 Tap **Result proposals**.
- 15 Select the result **Content** with the unit **mol/L**.
 - ⇒ The main parameters in the method function **Calculation R1** are filled in automatically.
- 16 Set **M [g/mol]** to **Hydrochloric acid** and tap **OK**.
- 17 Tap **Calculation R2**.
- 18 Tap **Delete**.
- 19 Tap **Save**.

5.2.5.3 Create an indirect shortcut

- 1 Tap **Start**.
 - ⇒ The **Start analysis** window opens.
- 2 Tap **AddToHome**.
 - ⇒ The **Shortcut parameters** window opens.

- 3 Enter a name for the shortcut in **Description**.
 - 4 Make sure **Immediate start** is deactivated.
 - 5 Tap **Save**.
- ⇒ The home screen with the new shortcut opens.

5.2.5.4 Perform the analysis

- 1 To ensure that the system has no leaks, check all tubes and closing points for firm seating.
- 2 Select the shortcut on the home screen.

⇒ The dialog **Start analysis** opens.
- 3 In the parameter **Enter sample size** enter the sample size.
- 4 Tap **Start**.

⇒ You are prompted to add the sample.
- 5 If the titration vessel is not attached to the titration arm, attach the titration vessel containing the HCl solution to the titration arm and tap **OK**.

⇒ The titration starts after the pre-stirring period.

⇒ During the titration, the screen displays the measured pH values over the titrated volume in [mL].

⇒ After the titration, a record is printed.

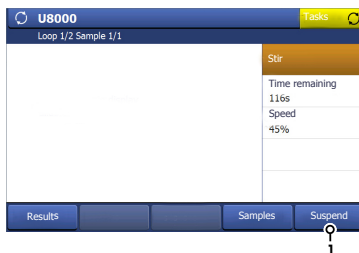
⇒ All results are saved.
- 6 After the titration, rinse the sensor with deionized water.
- 7 To view the saved result, tap **Home > Results**.

5.3 Stop methods

5.3.1 Suspending or stopping an analysis

- 1 Tap **Suspend** (1) to suspend the current analysis.

⇒ The dialog **Suspending options** opens.



- 2 Tap **Save series data** (1) to save the current sample series. Only the completed samples will be saved.

- ⇒ If the maximum permitted number of series has been reached, the series is not saved.
- ⇒ Sample data from a method that is waiting in a queue can be saved by selecting **Suspend > Save series data**.

- 3 Tap **Skip sample** (2) to skip the current sample and continue with the next sample of the series.

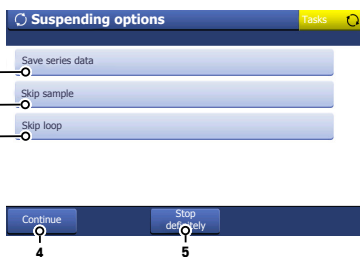
- ⇒ The current sample is marked in **Results** as **Excl.**

- 4 Tap **Skip loop** (3) to skip the loop and continue with the next loop of the series.

- ⇒ The loop is marked in **Results** as **Excl.**

- 5 Tap **Continue** (4) to continue with the current sample.

- 6 Tap **Stop definitely** (5) to stop the current method.



Note

- If a **Calib.** loop is skipped, the analysis continues in accordance with the corresponding method function **Calibration**.
- If required, it is possible to include a skipped sample (**Excl.**) into a statistic manually in the dialog **Results**.

6 Transporting the titrator

If you transport the titrator over long distances, use the original packaging.

- 1 Empty all tubes.
- 2 Empty the titration vessel.
- 3 Shut down the titrator.
- 4 Unplug the titrator.
- 5 Remove all cable connections.
- 6 Remove the titration vessel from the titration stand.
- 7 Remove all tubes.
- 8 Remove all burettes.
- 9 Move the titrator to the new location.

7 Care and maintenance

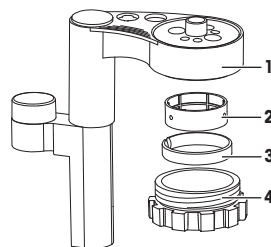
7.1 Cleaning

Housing of the titrator

- 1 Unplug the titrator.
- 2 Clean the housing of the titrator using a cloth moistened with alcohol.

Titration stand

- 1 Loosen the threaded ring (4) and remove it from the titration stand (1).
- 2 Remove the clamping ring (3) and the spacing ring (2) from the titration stand (1).
- 3 Clean the parts of the titration stand.
- 4 Place the clamping ring (3) and the spacing ring (2) in the threaded ring (4).
- 5 Screw the threaded ring (4) into the titration stand.



7.2 Maintenance

Mettler Toledo recommends that a preventive maintenance and calibration certification is done at least once a year through your local Mettler Toledo Service Organization.



NOTICE

Danger of damage to the titrator through leaking burettes!

Substances leaking out of burettes can enter the housing and damage parts of the installed boards.

- Check the burettes for leaks and replace leaking burettes.

Daily

- Remove the burettes from the titrator.
- If you work with corrosive substances, rinse the burettes.
- If you work with corrosive substances, check the burettes for leaks and replace leaking burettes.

Weekly

- If you use the burettes daily, check the burettes for leaks and replace leaking burettes.

Before periods of inactivity

- 1 Rinse the burettes.
- 2 Empty all tubes.
- 3 Empty the titration vessel.
- 4 Shut down the titrator.
- 5 Unplug the titrator.
- 6 Remove the titration vessel from the titration stand.
- 7 Remove all tubes.
- 8 Remove all burettes.

8 Disposal

In conformance with the European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. If you have any questions, please contact the responsible authority or the distributor from which you purchased this device. Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.



9 Technical data

Power supply	Input voltage	100...240 V AC ± 10 %
	Input frequency	50–60 Hz
	Primary connection socket	3 pin, IEC C14
	Power consumption	24 VA
	Connected load	24 V DC, 1.25 A
	Secondary connection plug	2 pin, DC plug
Dimensions	Width	210 mm
	Depth	333 mm
	Height	308 mm (with titration stand) 320 mm (ready-to-operate device)
	Weight	4.2 kg
Materials	Titration housing	Crastin® PBT
	Cover sheet	PET
	Protective cover	Copolymer
	Chassis	Stainless steel
	Titration stand	Crastin® PBT
	Lid (titration beaker)	Polypropylene
	Threaded ring	Polypropylene
	Three hole adapter	Polypropylene
	Dispensing tube / extraction tube	FEP
	Air tubes	Silicone
	O-ring (screw top)	EPDM
	O-ring (threaded ring)	FEP / silicone
	Sealing ring (bottle)	PTFE / silicone
	Seal (dispensing tube / extraction tube)	PTFE
	Connecting piece	Polypropylene
Ambient conditions	Ambient temperature	+5 °C - 40 °C
	Relative humidity	Max. 80 % (non-condensing) at 31 °C, linear fall to 50 % at 40 °C
	Use	In interior spaces
	Overvoltage category	II
	Pollution degree	2
	Max. installation height	2000 m (above sea level)

Contains runtime modules from decNumber (c) Copyright IBM Corporation 2001, 2004. All rights reserved.

Power Management

The devices have a power management system which prevents the titrator from switching off unexpectedly in the event of a power overload. Tasks which would cause a power overload, because a number of pumps, stirrers and burette drives are already in use, cannot be started at all. A notification brings the start attempt to the attention of the user. It is advisable, if possible, to connect pumps and stirrers directly to sample changers or other devices which have their own power supply, such as a TBox, instead of to the titrator itself.

To protect your product's future:

METTLER TOLEDO Service assures the quality, measuring accuracy and preservation of value of this product for years to come.

Please request full details about our attractive terms of service.

www.mt.com/titration

For more information

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